Spatial & temporal patterns of OHV use at the Dove Springs OHV Open Area, California

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USGS science for a changing world

Western Ecological Research Center
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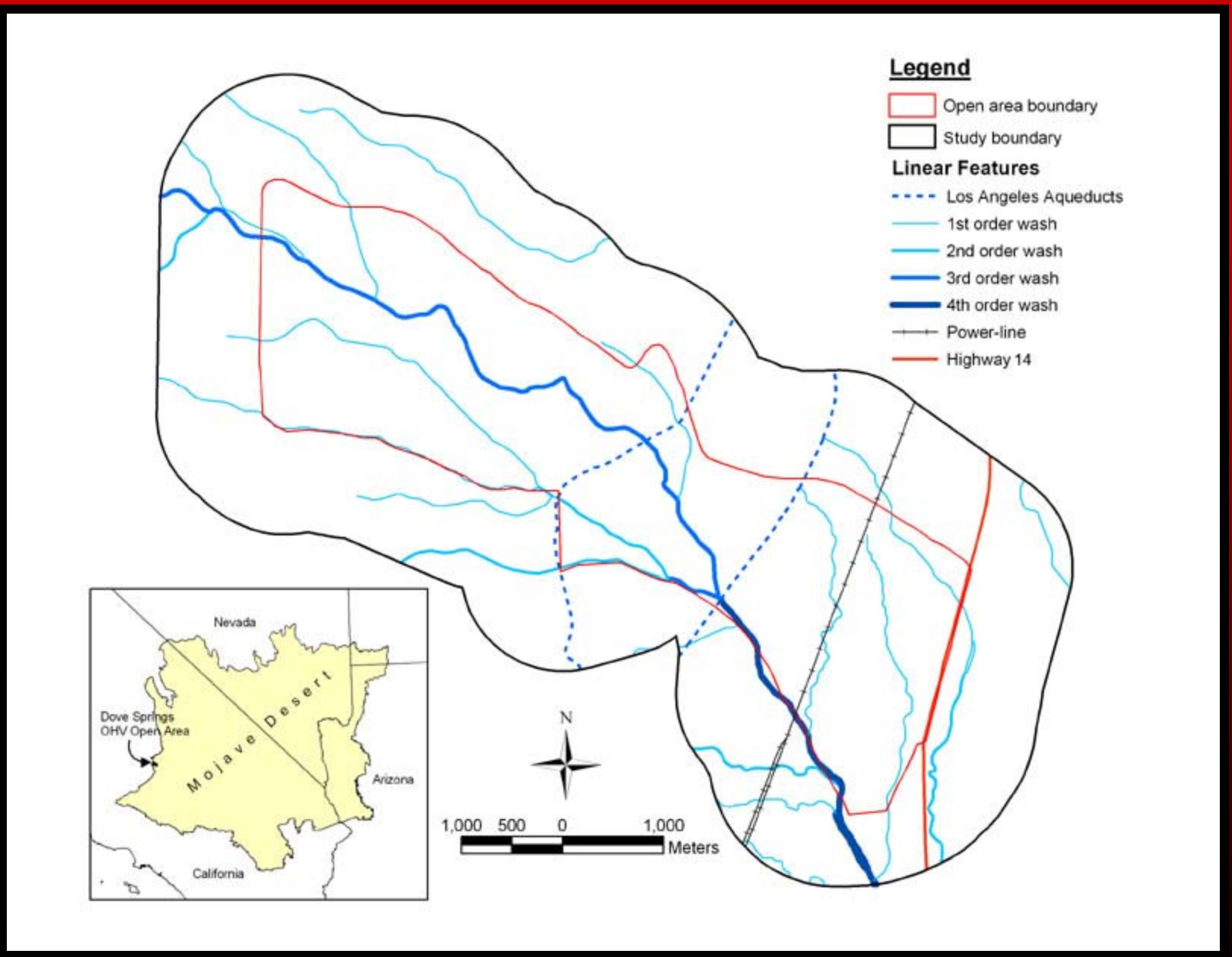
Project Goals

- Document trends in OHV disturbance at an intensely-used site over the past 40 years
- Analyze the spatial distribution of OHV disturbance, particularly in relation to other natural and manmade linear disturbances
- Provide a disturbance history for studies addressing vegetation and wildlife responses to OHV use

Methodology

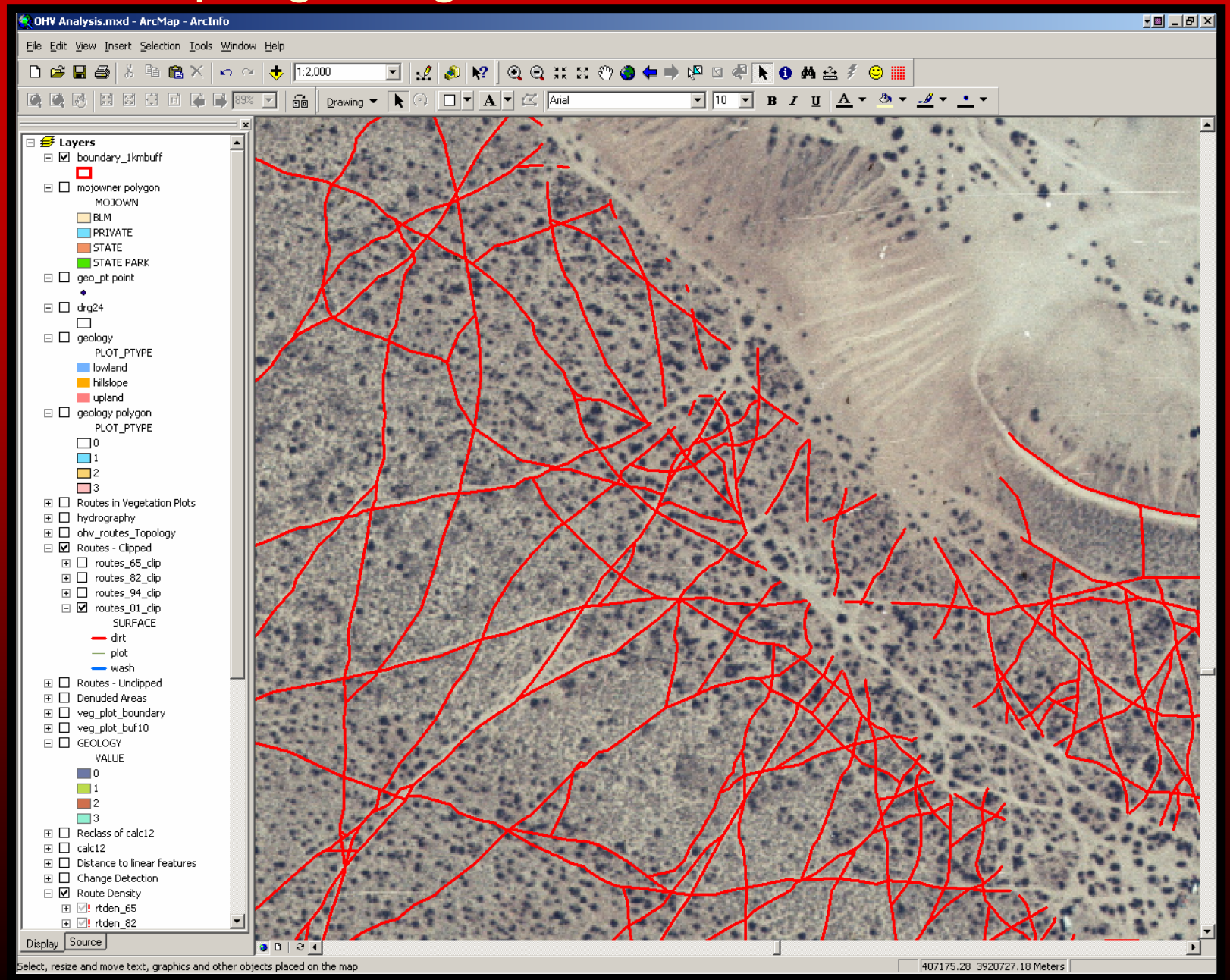
- Series of aerial photographs (1965, 1982, 1994, 2001)
- Photographs digitally scanned
- OHV routes and disturbed areas digitized into a GIS database
- Analyses of spatial and temporal patterns

Dove Springs OHV Open Area



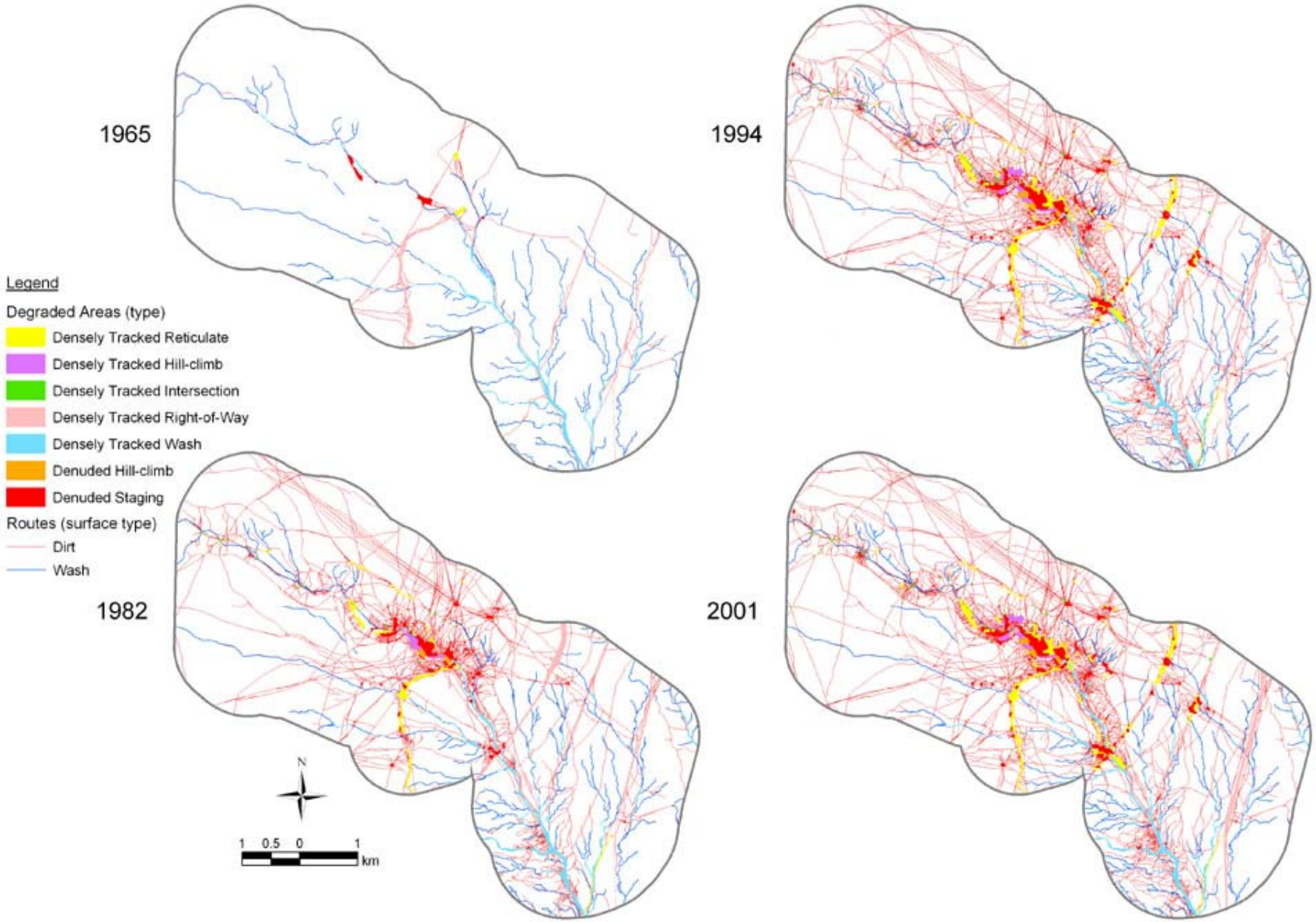
Aerial Photography

Heads-up digitizing in ArcGIS 8

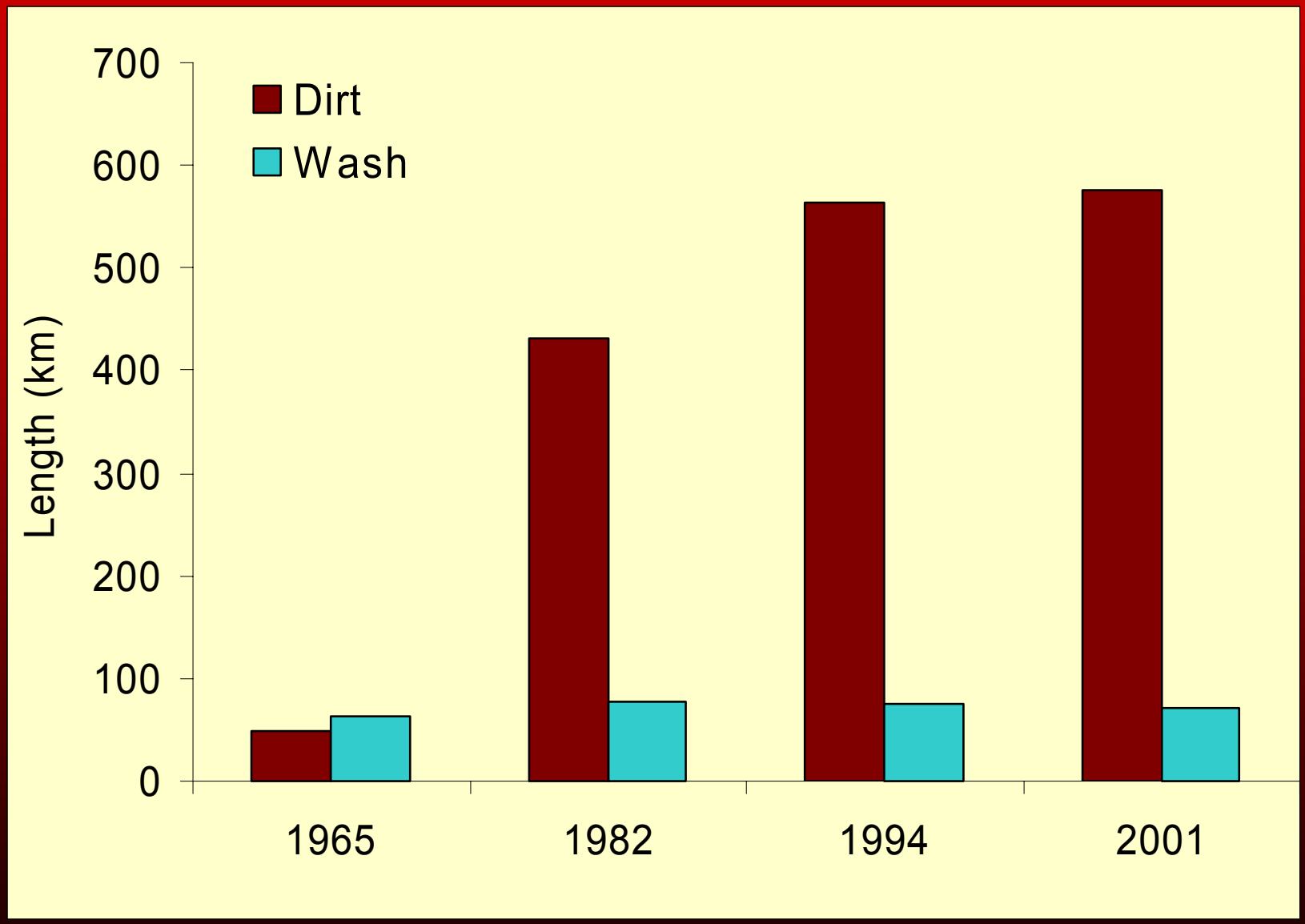


OHV Routes – Discrete linear features (dirt or wash)

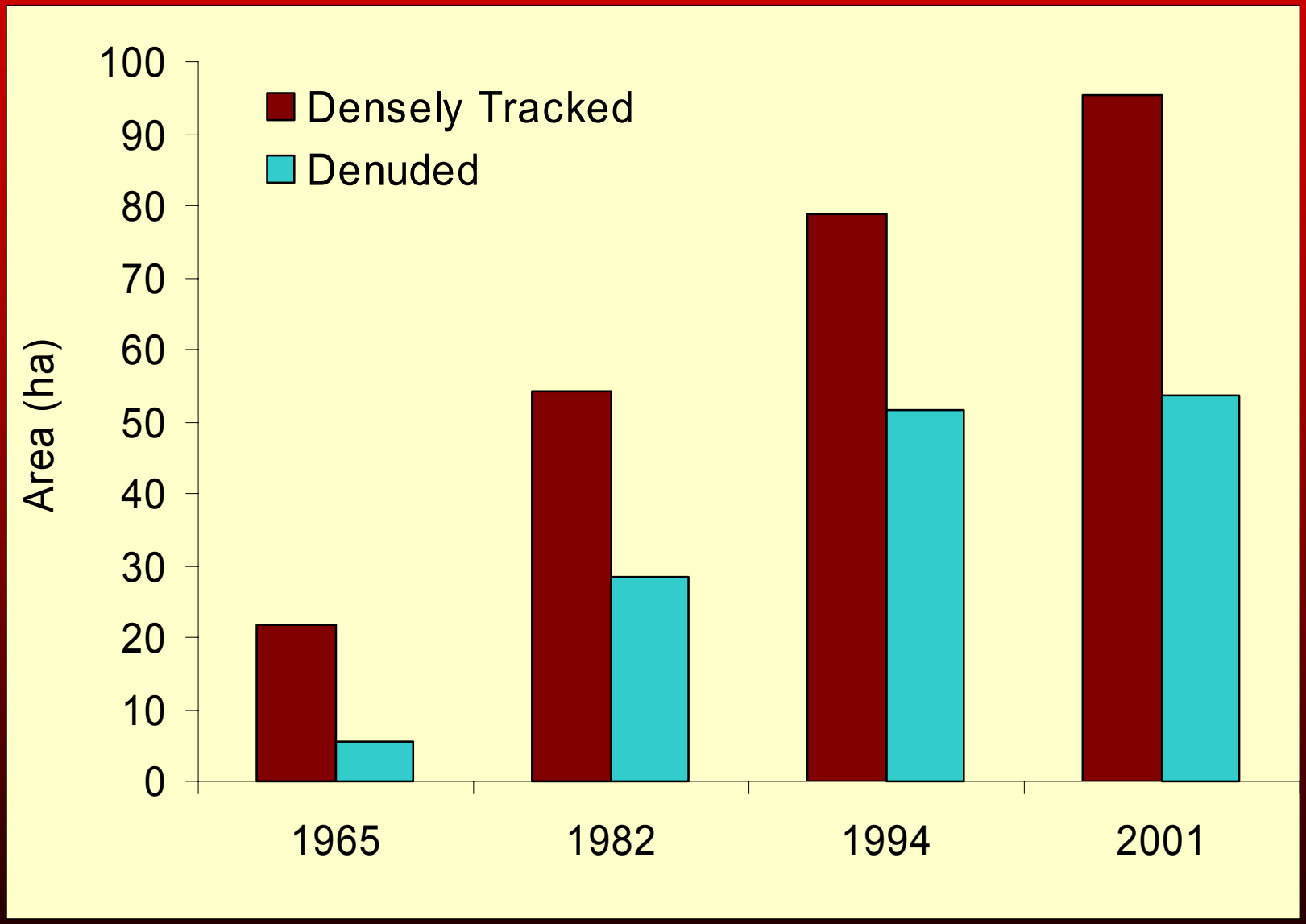
Degraded Areas – Discrete polygon features (densely tracked & denuded)


1965
1994
1982
2001
Legend
Degraded Areas (type)
Densely Tracked Reticulate
Densely Tracked Hill-climb
Densely Tracked Intersection
Densely Tracked Right-of-Way
Densely Tracked Wash
Denuded Hill-climb
Denuded Staging
Routes (surface type)
Dirt
Wash
N
1 0.5 0 1
km

Total Route Length



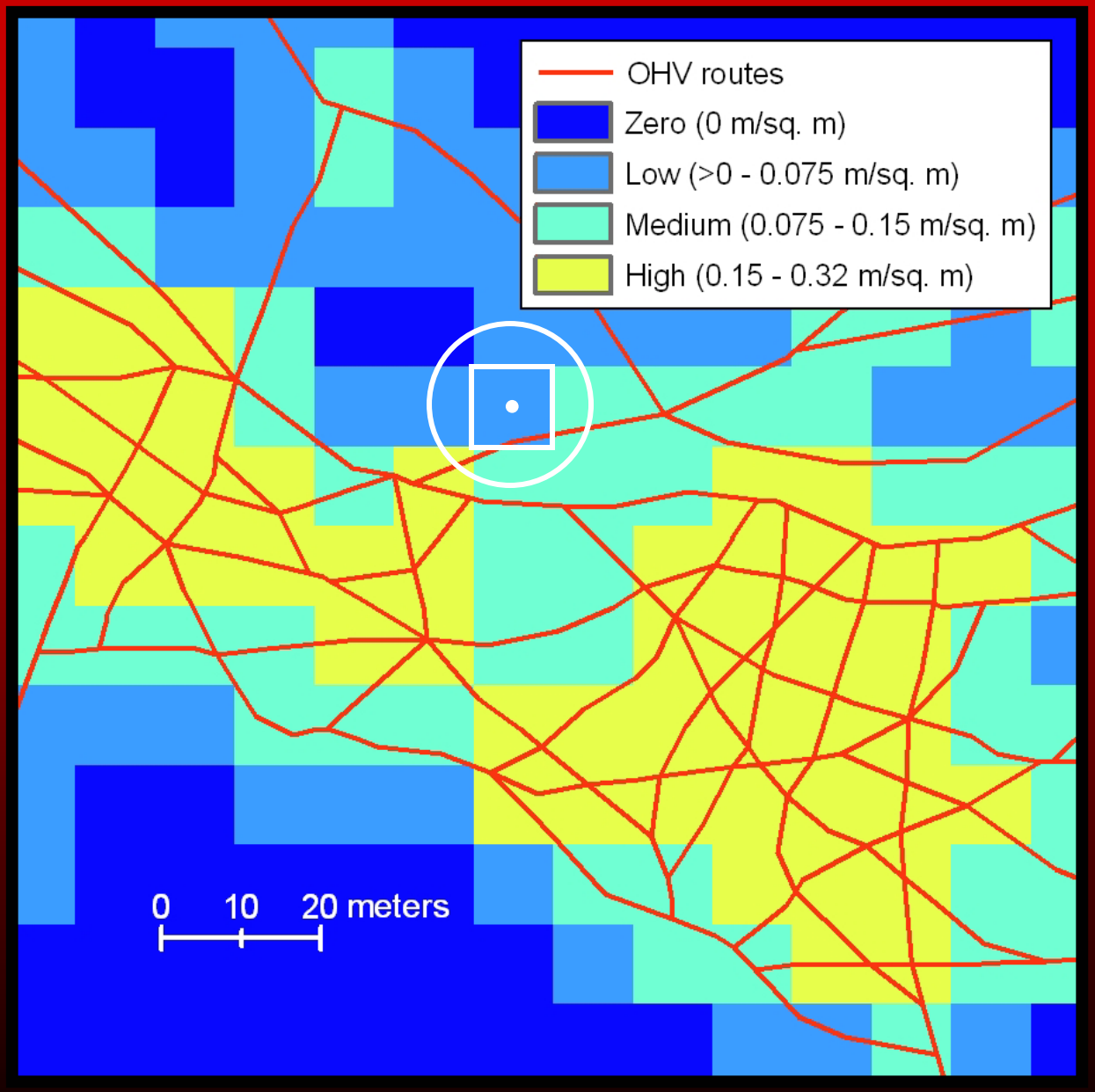
Degraded Area

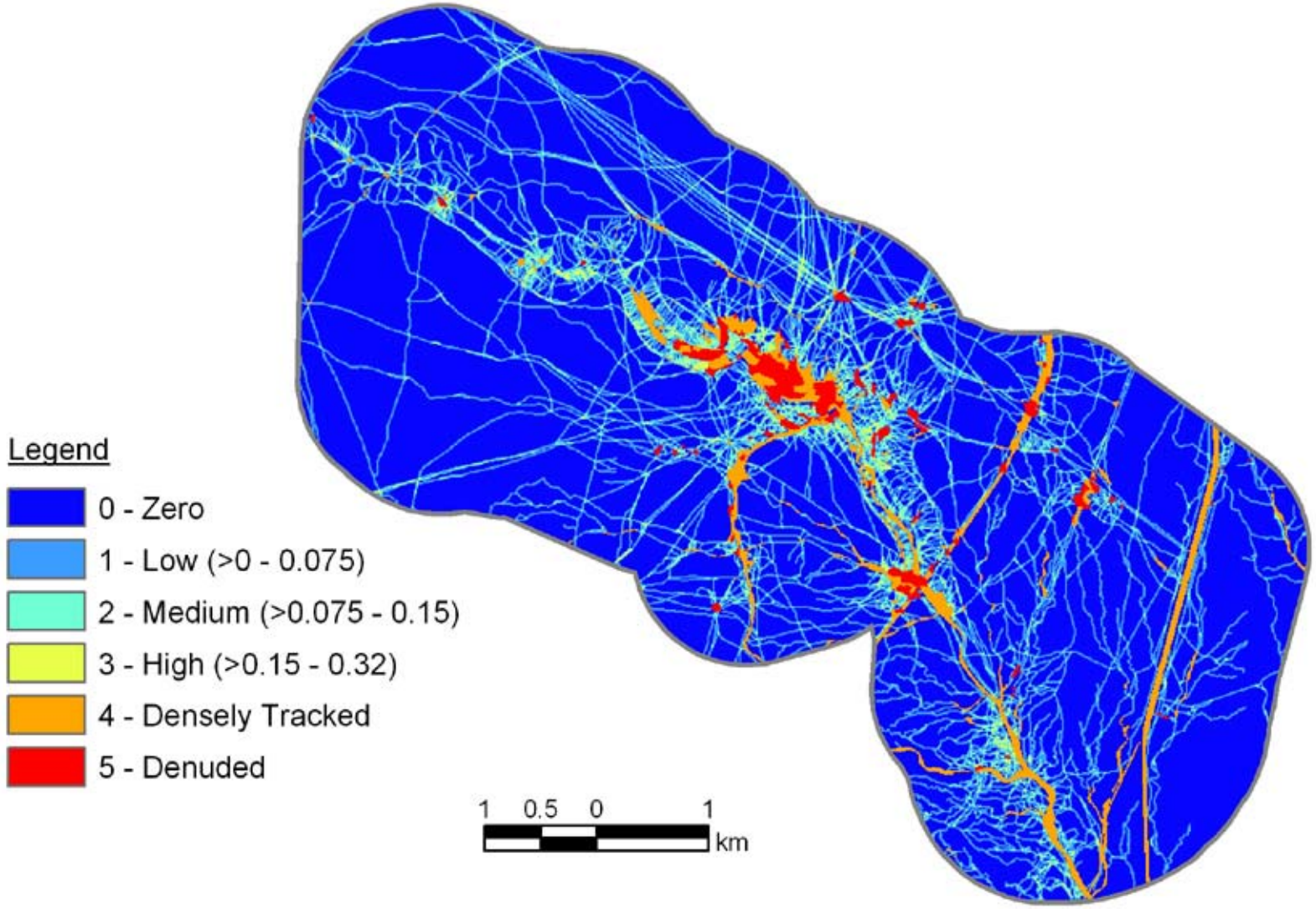


Density Analyses

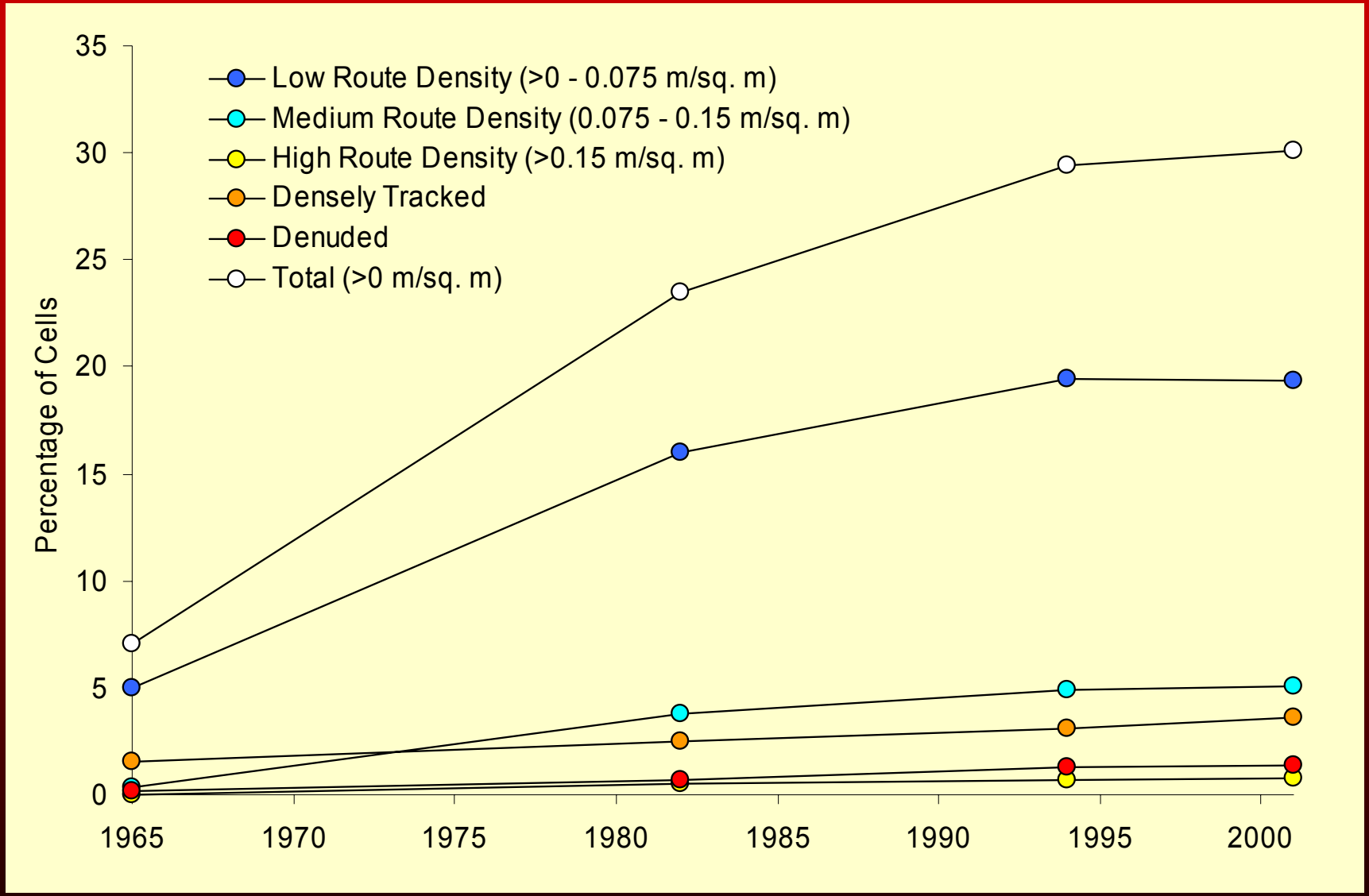
- Route density (m/m^2) calculated within 10 m $\times$ 10 m grid cells using a 10 m search radius
- Densities classified into 4 levels: zero, low, medium, & high
- Densely-tracked and denuded areas added

Track densities

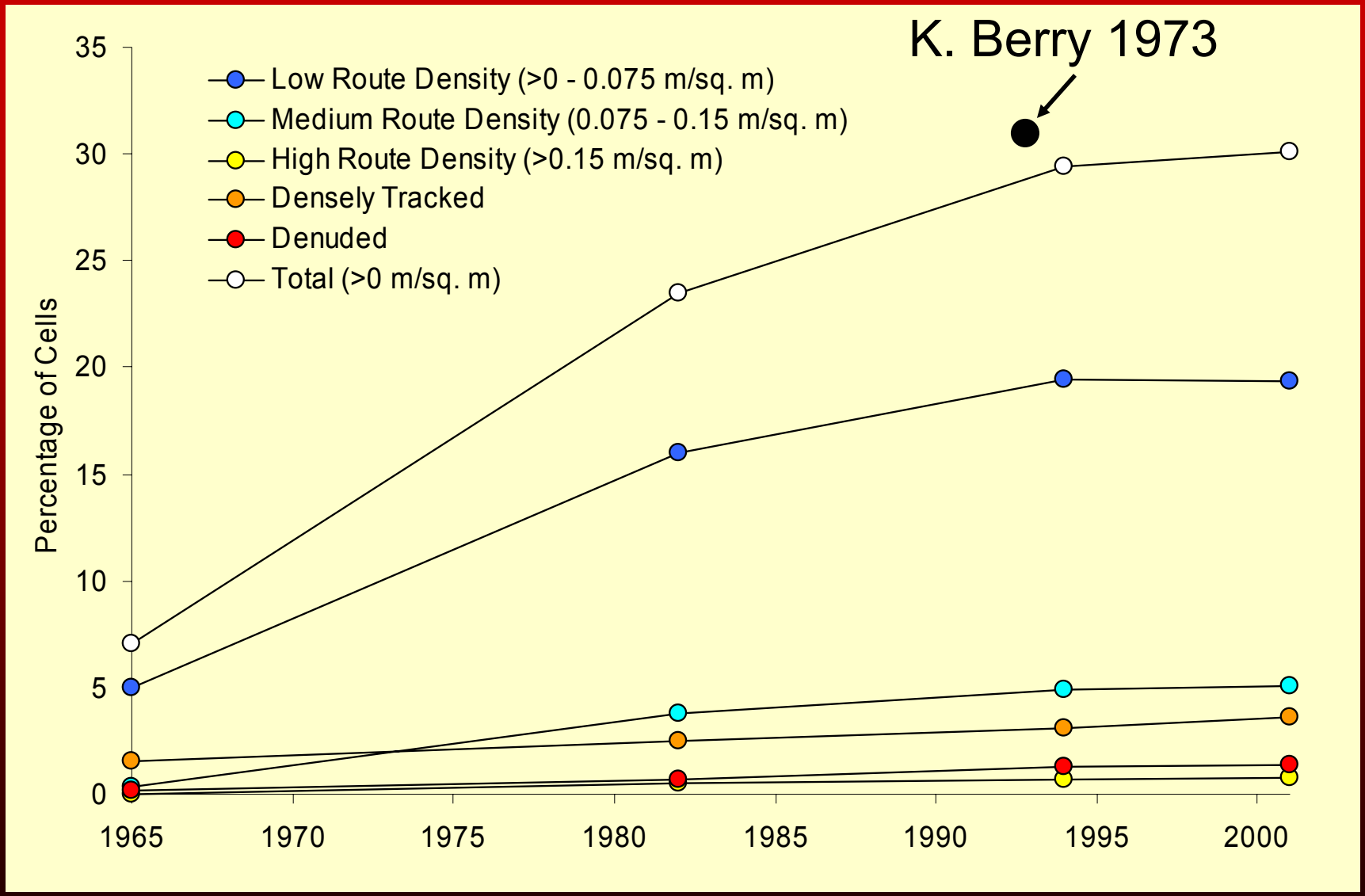



Legend
0 - Zero
1 - Low (>0 - 0.075)
2 - Medium (>0.075 - 0.15)
3 - High (>0.15 - 0.32)
4 - Densely Tracked
5 - Denuded
1 0.5 0 1
km

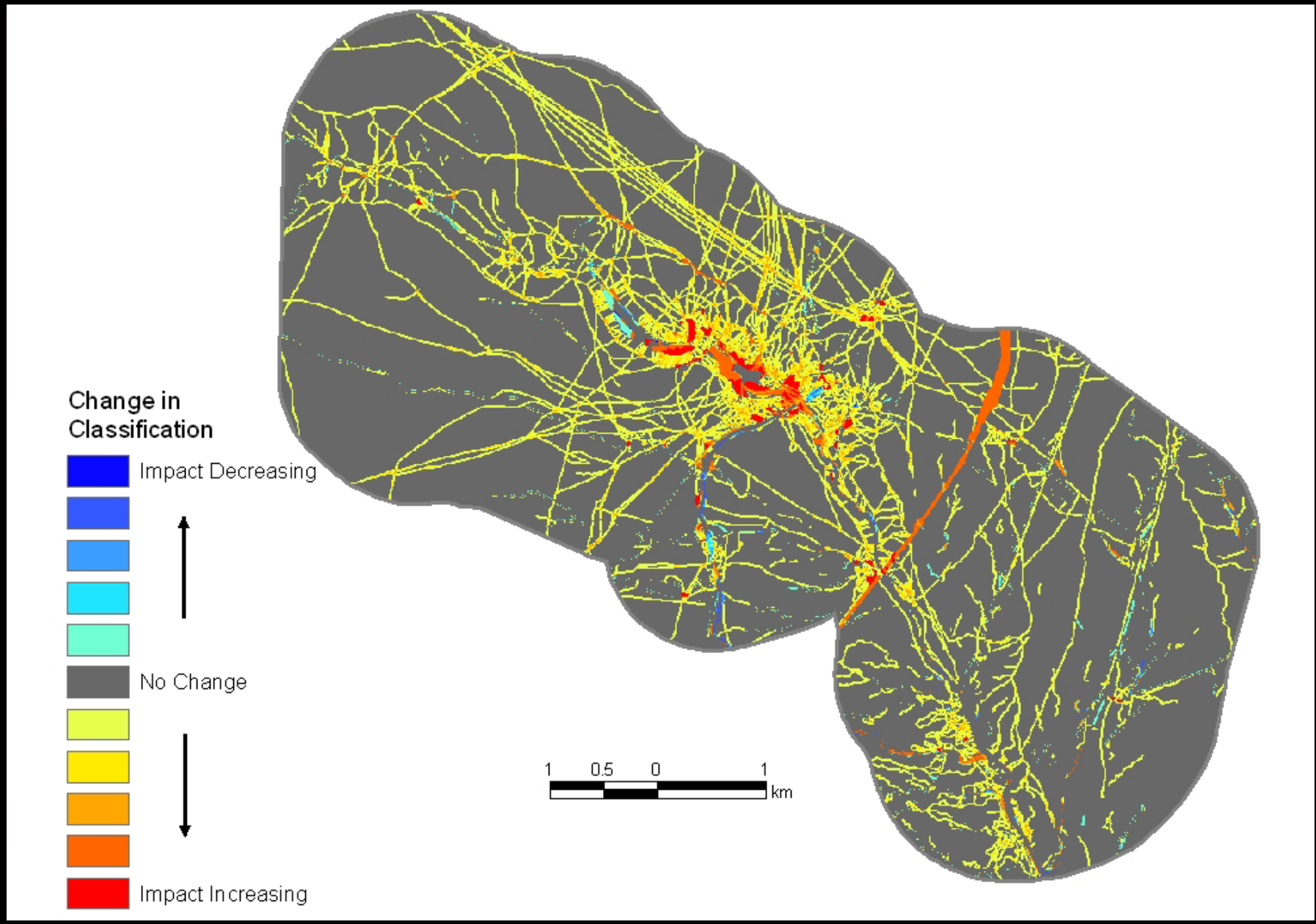
Change in cell distribution



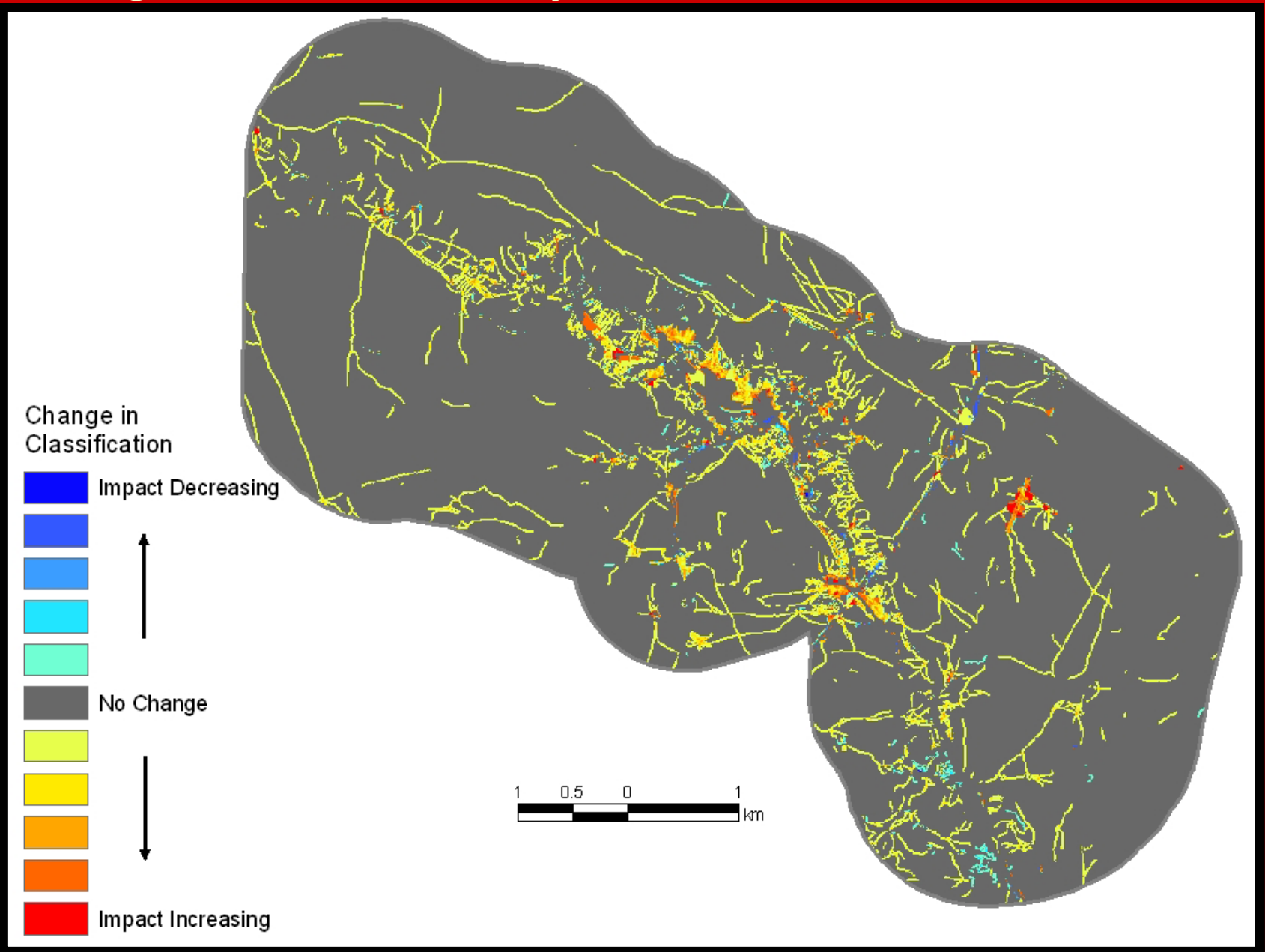
Change in cell distribution



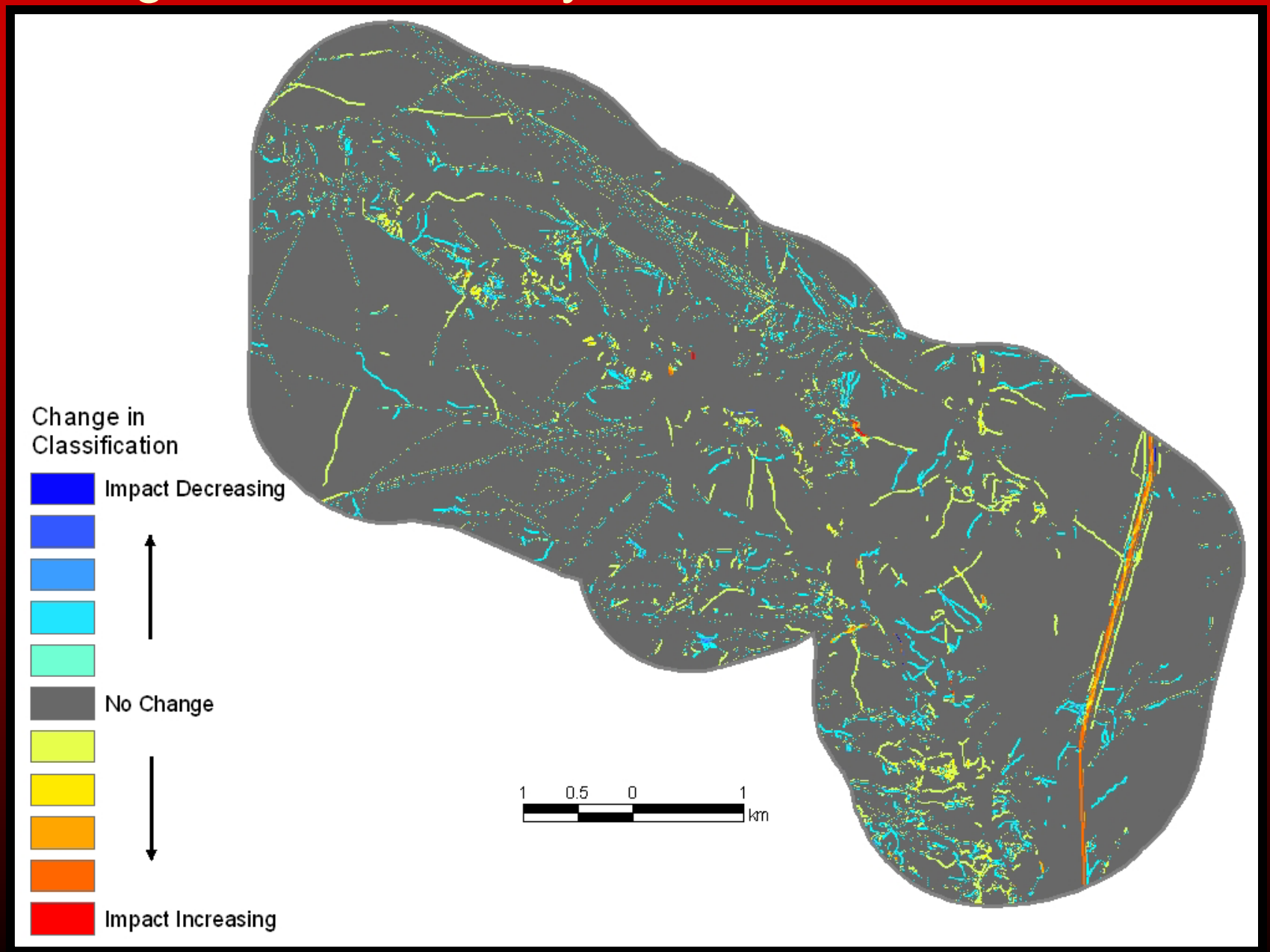
Change detection analysis – 1965 to 1982



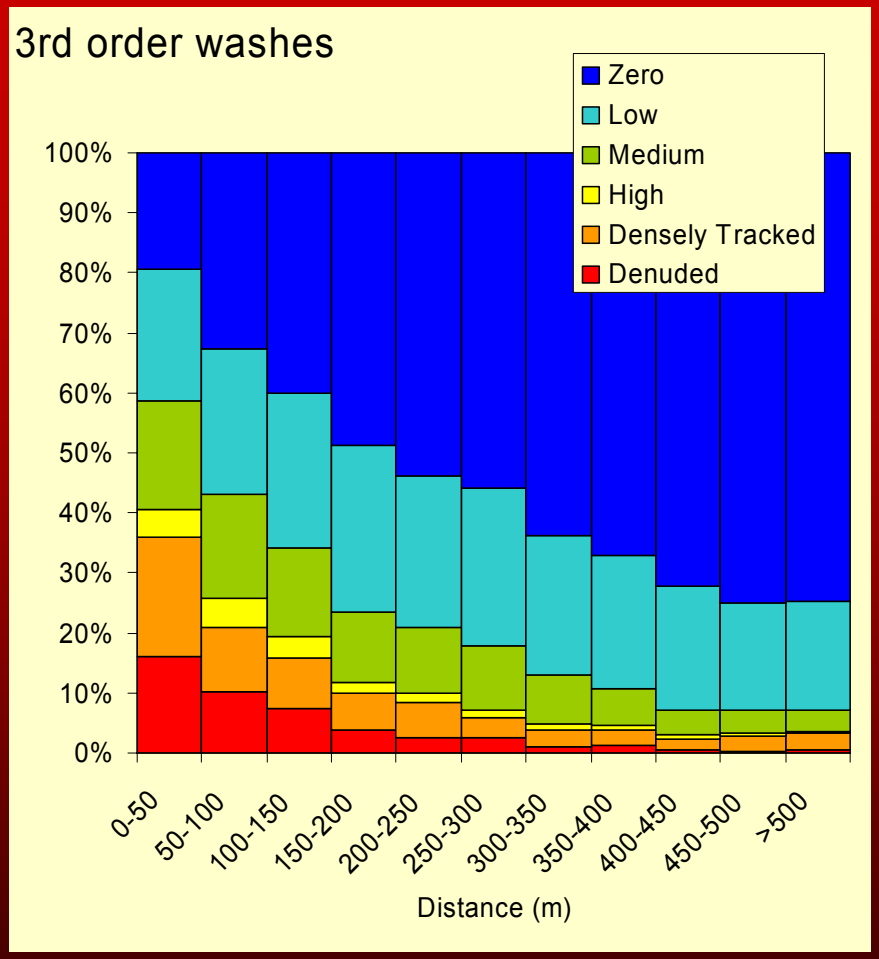
Change detection analysis – 1982 to 1994

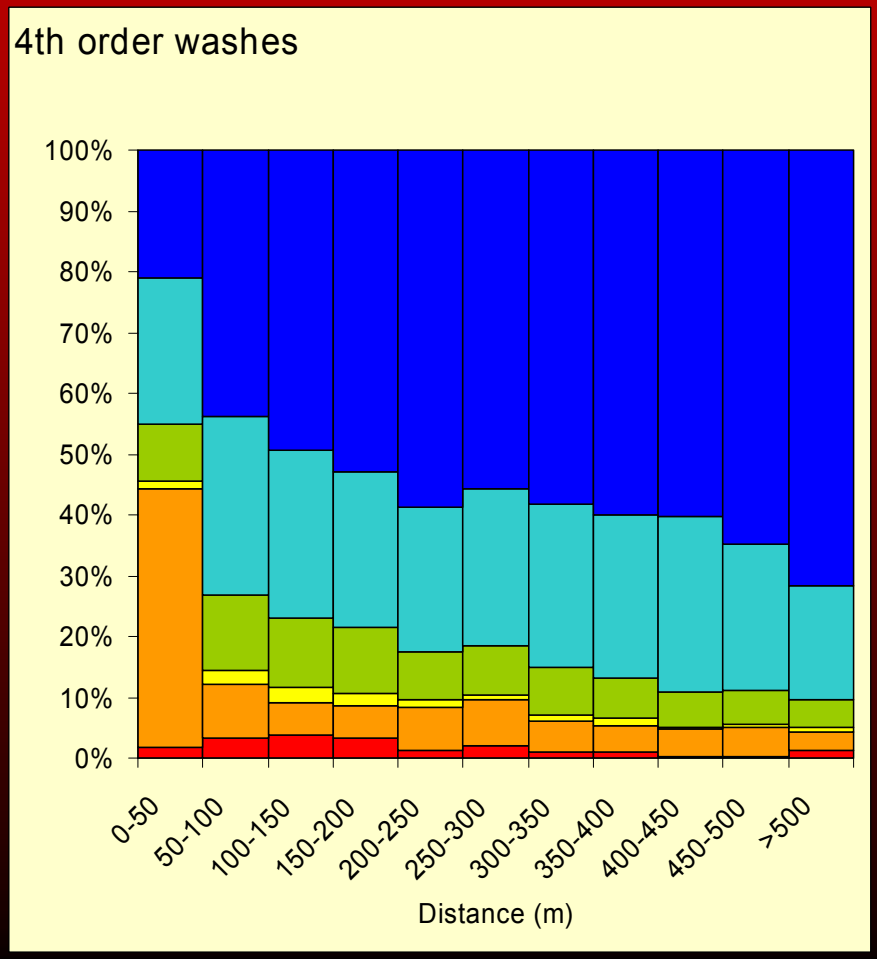


Change detection analysis – 1994 to 2001

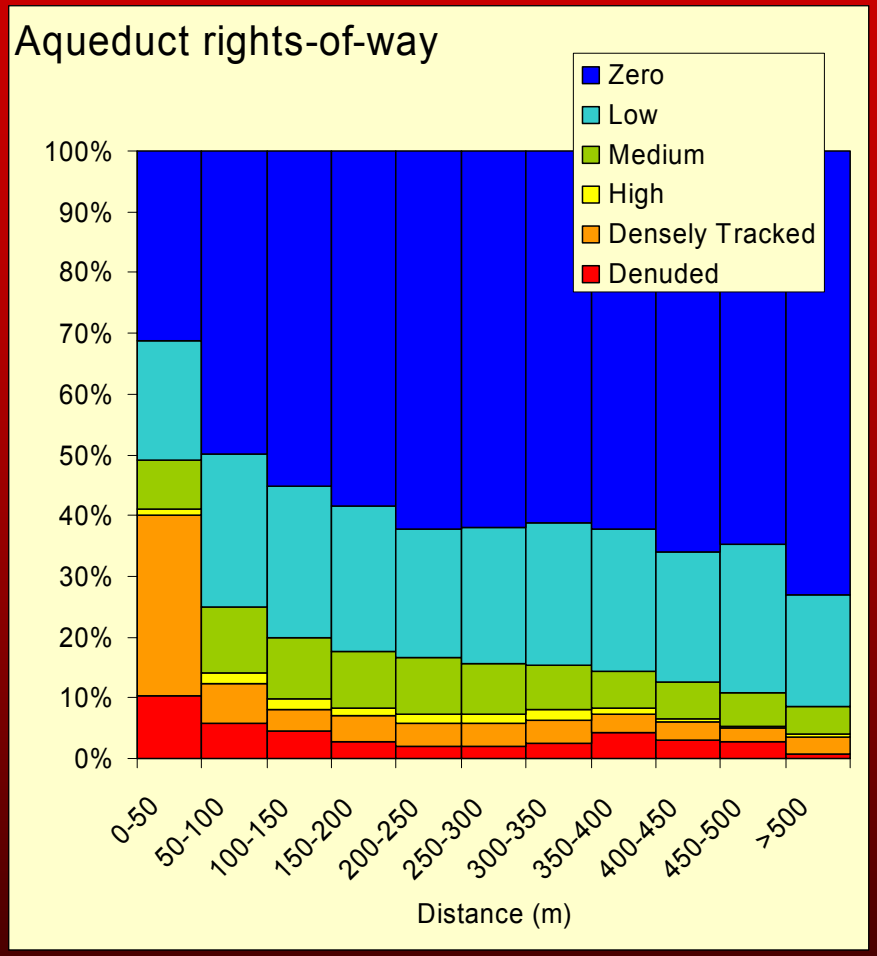


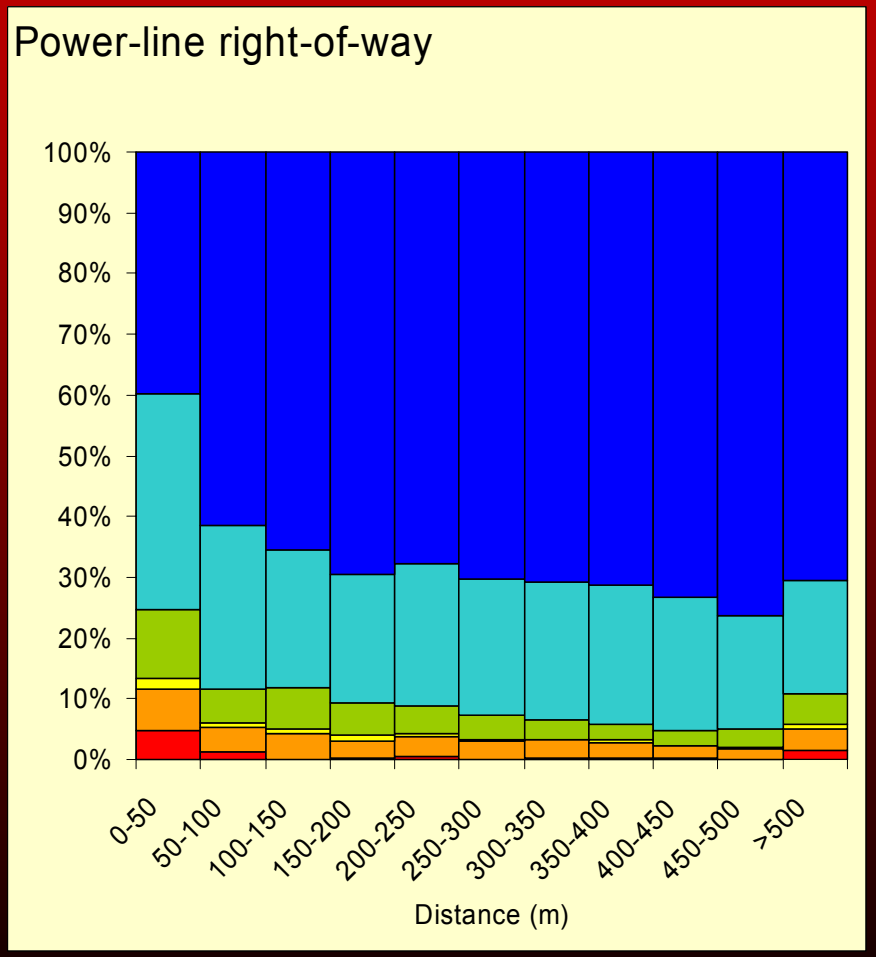
Impact near washes





Impact near rights-of-way





Summary

- Greatest changes from 1956 to 1982, with a decreasing rate of change from 1982 to 2001
- OHV impact correlated with other natural & human-made linear features
- Aerial mapping can be a useful tool for documenting historic changes in OHV use